



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> :  B41F 33/00, H04N 1/407		A1	(11) International Publication Number: <b>WO 97/42033</b>
			(43) International Publication Date: 13 November 1997 (13.11.97)
(21) International Application Number: PCT/GB97/01217		(81) Designated States: US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: 2 May 1997 (02.05.97)		Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(30) Priority Data: 9609288.7 3 May 1996 (03.05.96) GB			
(71) Applicant (for all designated States except US): FOCOLTONE INTERNATIONAL LIMITED [GB/GB]; Churchview House, Penkridge Road, Acton Trussell, Stafford ST17 0RJ (GB).			
(72) Inventors; and			
(73) Inventors/Applicants (for US only): CHALMERS, Malcolm, George [GB/GB]; 15 Fryth Mead, St. Albans AL3 4TN (GB) HUMPHIREY, John, William, Lewis [GB/GB]; Churchview House, Penkeridge Road, Acton Trussell, Stafford ST17 0RJ (GB). LOVATT, Stephen, Thomas [GB/GB], 21 Harbourfield Road, Banstead Village, Surrey SM7 2DE (GB). PAGNAC, André, Etienne, Jean, Laurent, Marie [FR FR], 31, rue Cavendish, F-75019 Paris (FR).			
(74) Agents: JAMES, Michael, John, Gwynne et al.; Wynne-Jones, Laine & James, Morgan Arcade Chambers, 33 St. Mary Street, Cardiff CF1 2AB (GB).			
(54) Title: COLOUR PRINT STANDARDISATION			
(57) Abstract			
<p>A master chart comprises a representation of various blocks (1) of colour produced by suitable combinations of the base colours cyan, magenta, yellow and black (C, M, Y, K). There are also illustrations of colour prints (2) which are to be printed by a copying machine onto a sheet. For the colour standardisation procedure test sheets are provided onto which the images from the master chart are to be printed. These carry the same array of colour blocks (1A) and picture representations (2A) but the block and colour representations are offset with respect to the positioning of the corresponding blocks on the master chart. The operator can compare the various colour blocks against one another and make an estimation as to what adjustments are needed to the copier to ensure that a more acceptable print is achieved. The test sheet could incorporate holes adjacent to each of the colour patches through which the colour patches from the master chart can be viewed.</p>			

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Colour Print Standardisation

When colour printing is carried out by any form of print engine (including laser copiers, ink jet printers and dye transfer printers) there is no guarantee that the colour output will necessarily achieve the correct effect. Colour adjustment within the print engine may therefore be needed and an experienced operator can, after suitable trial and error, achieve an acceptable output. There is however no standard method for adjusting the colour output. Furthermore the input image might be in the form of a flat copy scanned by a copier or in the form of a digital file in a computerised print engine.

According to the invention there is provided a method of standardising colour printing using a print engine wherein a copy of a prepared master chart is printed onto or otherwise created relative to a prepared test sheet, with the master chart and test sheet carrying a series of equivalent colour patches in the same lay out but offset on the test sheet from the lay out on the master chart, the copied colour output of the colour patches, printed onto the test sheet, or otherwise produced from the master chart, is compared with the adjacent preprinted colour patches on the test sheet and the print engine is adjusted to correct any imbalance between the preprinted and copied colour patches.

The master chart may be in the form of a lithograph print or could be a digitally stored image in a computerised printing system which is then reproduced on a display screen. The test sheet could incorporate strategically

positioned holes adjacent to each of the colour patches through which the colour patches, produced from the master chart onto a blank sheet or shown on the display screen can, be viewed for copy colour comparison.

5        The imbalance comparison between the reproduced colour patches from the master chart and the preprinted colour patches on the test sheet may be achieved visually or by suitable instrumentation. Correction of any imbalance can be made either by estimation or by instrumental calculation.

10      The colour patches could ideally be those created on a colour chart using the principles of Patent No. EP (UK) 0119836.

15      The master chart and the test sheet may additionally carry image registration symbols which will enable the user to determine image position adjustment to ensure correct registration of a printed image when normal printing commences.

20      The invention may be performed in various ways and a preferred embodiment will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is an illustration of a master chart for use in a colour printing standardisation system of this invention;

25      Figure 2 is an illustration of a test sheet for use with the chart of Figure 1; and

Figure 3 is an illustration of a combination, by printing of the master chart of Figure 1 onto the test sheet

of Figure 2.

The master chart shown in Figure 1 comprises a representation of various blocks 1 of colour produced by suitable combinations of the base colours cyan, magenta, yellow and black (C,M,Y,K). There are also illustrations of colour prints 2 which are to be printed by a copying machine onto a sheet. For the colour standardisation procedure the sheets onto which the images will be printed are the test sheets shown in Figure 2. These carry the same array of colour blocks 1A and picture representations 2A but the block and colour representations are offset with respect to the positioning of the corresponding blocks on the master chart of Figure 1. When a print of the master chart is made onto the test sheet a representation as shown in Figure 3 may be achieved. The operator can compare the various colour blocks against one another and make an estimation as to what adjustments are needed to the copier to ensure that a more acceptable print is achieved. The comparison and correction process can be carried out manually or automatically by suitable instruments. The process can then be repeated to determine whether the changes made are adequate.

It will be noted also that there are certain registration marks on the master chart and the test sheet. Firstly there are arrow indications 3 and 3A which should be aligned with one another when the copying takes place. Additionally the master chart has a cross-wire device 4 in each corner and the test sheet has a segment logo 4A in each corner. If these do not register satisfactorily with one

another the operator can adjust the copier (or the positioning of the master sheet) to ensure closer registration onto the correct area of the sheet. This will automatically bring into line the adjacent blocks 1 and 1A.

5 To standardise the colour produced from digital files, the digital master chart is processed by a computer and used to drive the print engine, again producing an image alongside the pre-printed image. Comparison and adjustments are as before.

10 In the case of print engines requiring materials for making copies that cannot be pre-printed by lithography, a copy of the master chart, with holes through which to observe and/or measure the copied image can be used for the comparison and subsequent adjustments.

15 As the test sheet is printed by lithography to printing industry standards, the print engine is thus set to the same standards.

CLAIMS

1. A method of standardising colour printing using a print engine wherein a copy of a prepared master chart is printed onto or otherwise created relative to a prepared 5 test sheet, with the master chart and test sheet carrying a series of equivalent colour patches in the same lay out but offset on the test sheet from the lay out on the master chart, the copied colour output of the colour patches, printed onto the test sheet, or otherwise produced from the 10 master chart, is compared with the adjacent preprinted colour patches on the test sheet and the print engine is adjusted to correct any imbalance between the preprinted and 15 copied colour patches.

2. A method according to Claim 1, wherein the master chart is in the form of a lithograph print.

3. A method according to Claim 1, wherein the master chart is in the form of a digitally stored image in a computerised printing system which is then reproduced on a display screen.

20 4. A method according to any one of Claims 1 to 3, wherein the test sheet incorporates strategically positioned holes adjacent to each of the colour patches through which the colour patches, produced from the master chart onto a blank sheet or shown on the display screen, are viewed for 25 copy colour comparison.

5. A method according to any one of Claims 1 to 4, wherein the imbalance comparison between the reproduced colour patches from the master chart and the preprinted

colour patches on the test sheet is achieved visually or by suitable instrumentation.

6. A method according to any one of Claims 1 to 5, wherein correction of any imbalance is made either by 5 estimation or by instrumental calculation.

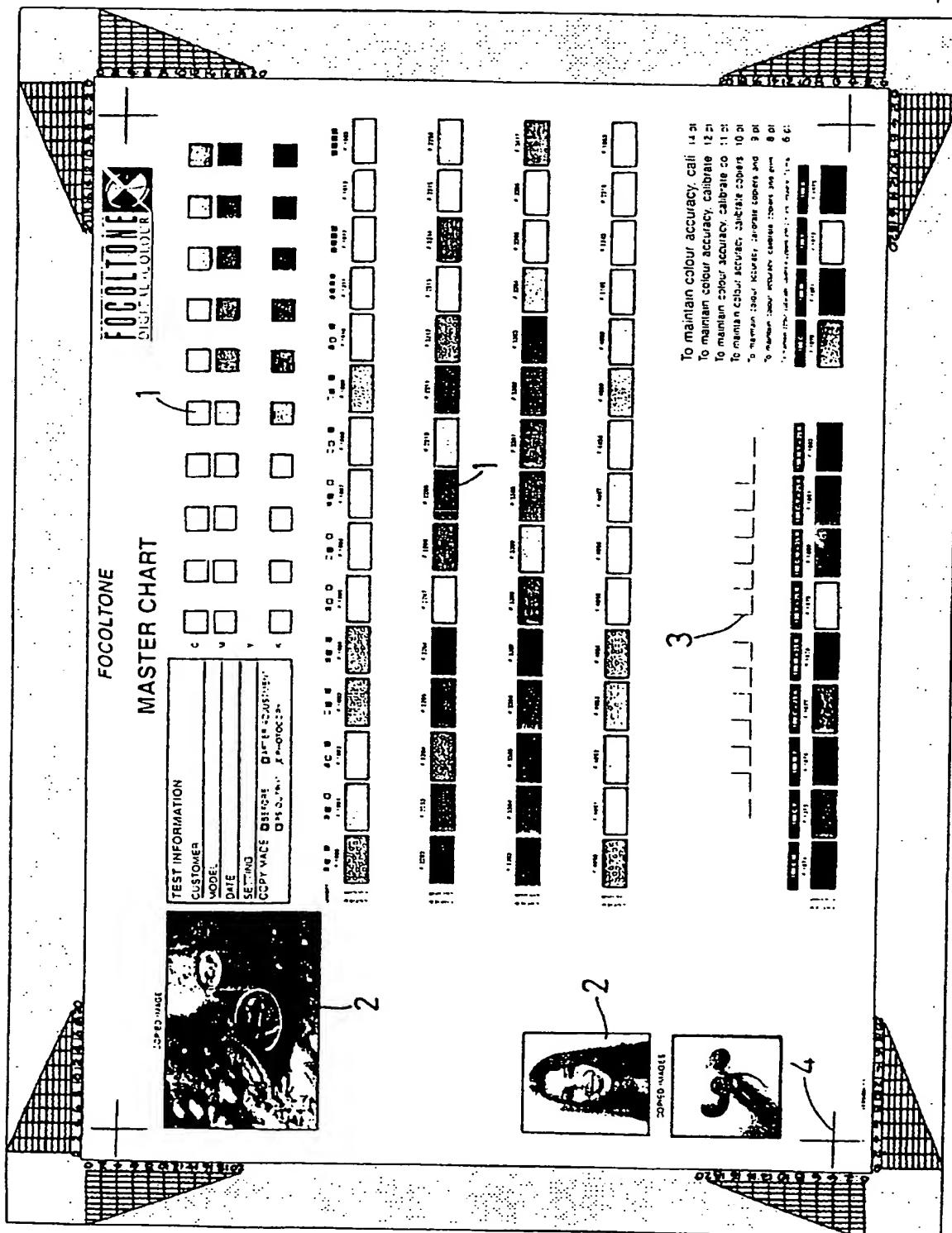
7. A method according to any one of Claims 1 to 6, wherein the colour patches are those created on a colour chart using the principles of Patent No. EP (UK) 0119836.

8. A method according to any one of Claims 1 to 7, 10 wherein the master chart and the test sheet additionally carry image registration symbols which enable the user to determine image position adjustment to ensure correct registration of a printed image when normal printing commences.

15 9. A method of standardising colour printing substantially as herein described with reference to the accompanying drawings.

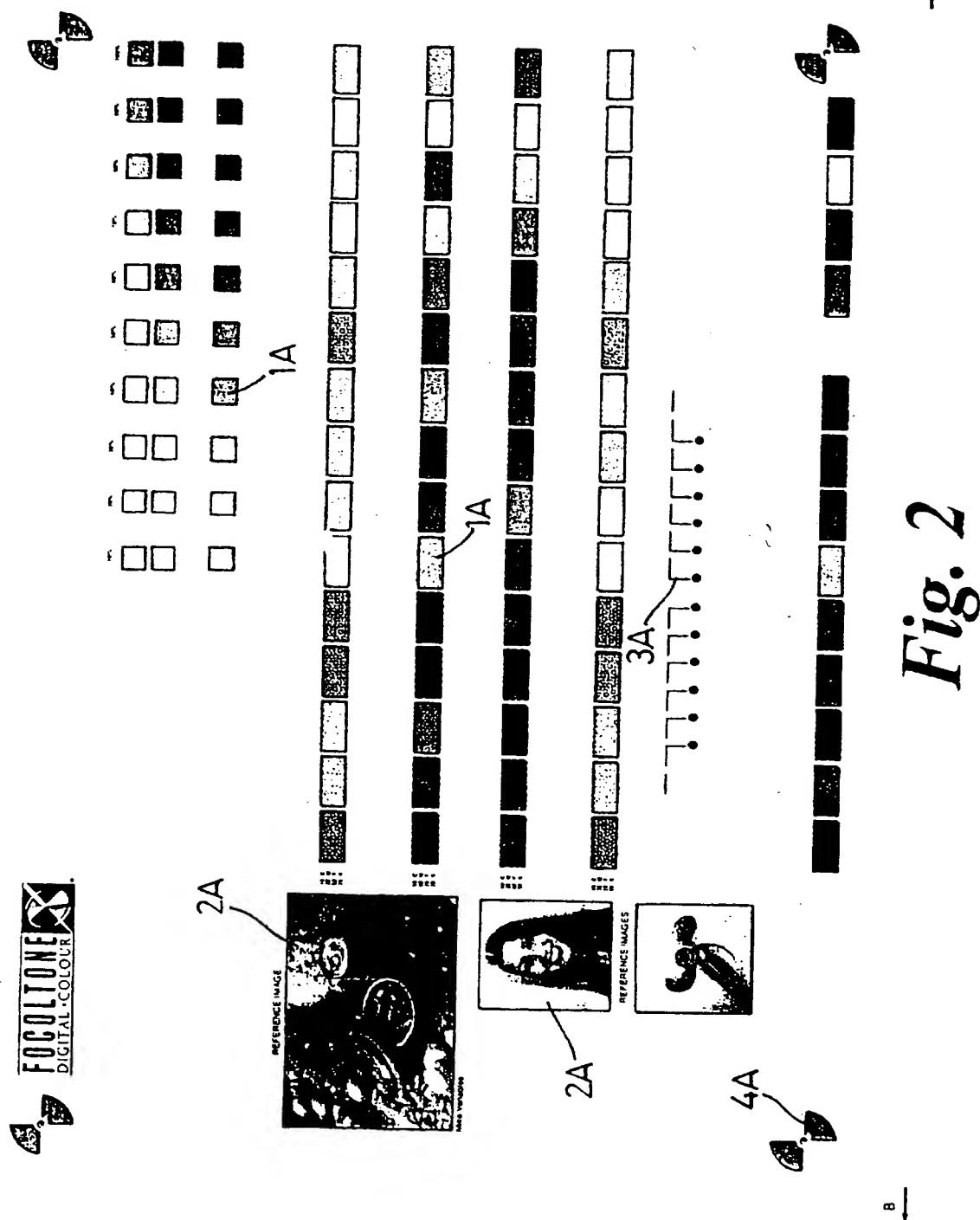
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Fig. 1



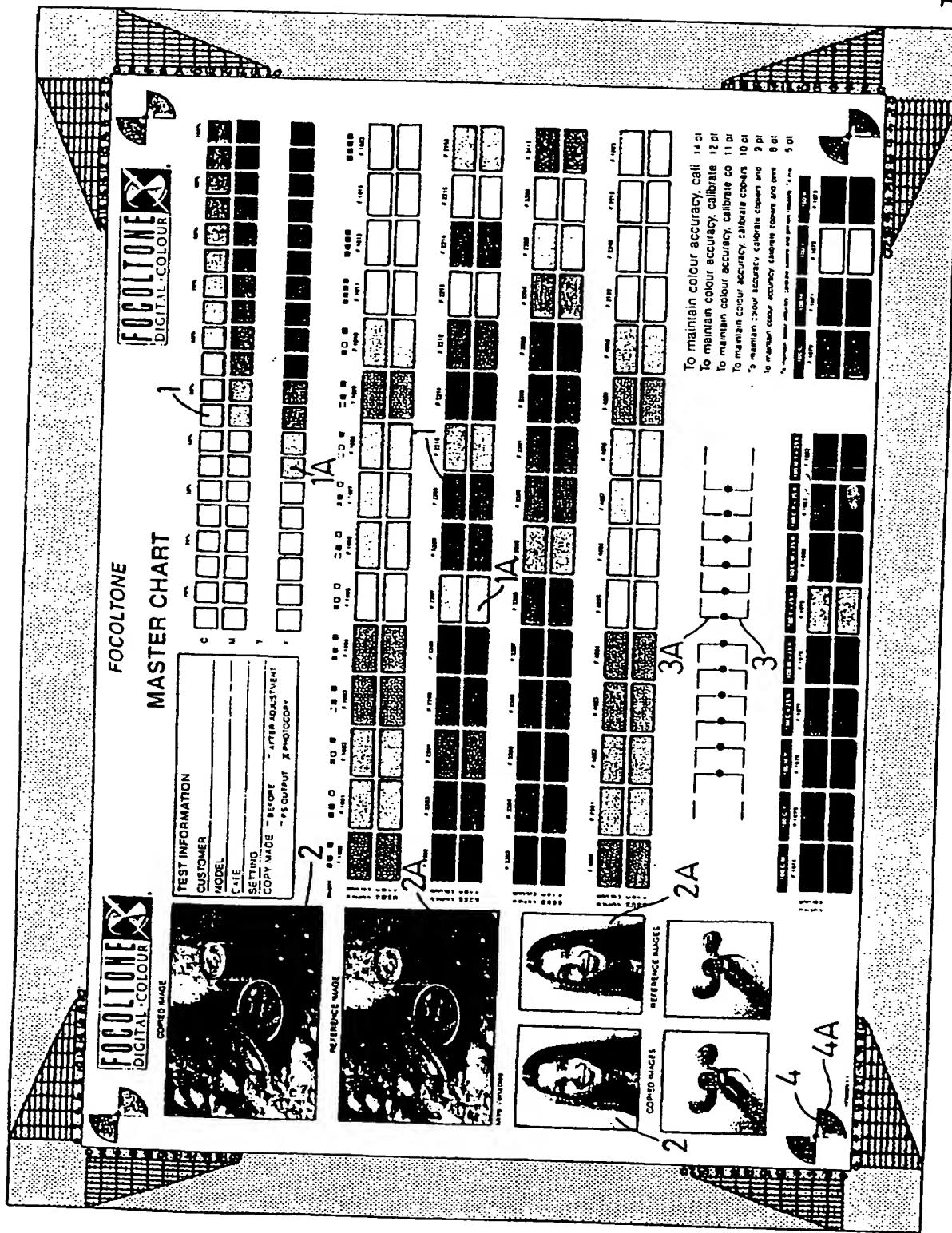
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Fig. 3



# INTERNATIONAL SEARCH REPORT

Int'l. Appl. No.  
PCT/GB 97/01217

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 B41F33/00 H04N1/407

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 B41F H04N G03F G03C G03D

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 310 248 A (N. J. MEREDITH) 12 January 1982 see column 1, line 64 - column 4, line 8 ---	1,2,5,6, 9
A	US 5 063 583 A (B. M. GALKIN) 5 November 1991 see column 3, line 19 - line 33 see column 6, line 25 - line 34 see column 6, line 51 - line 68 ---	1,5,9
P,A	US 5 598 272 A (R. S. FISCH ET AL.) 28 January 1997 see column 3, line 13 - column 4, line 9 ---	2,4
A	US 4 687 334 A (TADASHI MIYAKAWA) 18 August 1987 see column 2, line 47 - column 3, line 38 ---	4 -/-

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Patent family members are listed in annex.

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Date of the actual completion of the international search

3 September 1997

Date of mailing of the international search report

22.09.97

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Authorized officer

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Int	lational Application No
PCT/GB 97/01217	

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 492 474 A (B. W. MILLER) 8 January 1985 see column 5, line 57 - line 68 ---	4
A	US 4 929 978 A (KATSUHIRO KANAMORI ET AL.) 29 May 1990 -----	

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte onal Application No

PCT/GB 97/01217

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